

Early rehabilitation after total mastectomy and immediate reconstruction with tissue expander insertion in breast cancer patients

Document Date: May 6, 2018

Methods

Subjects

After obtaining approval by our Institutional Review Board, a retrospective chart review of prospectively collected data was conducted in patients who underwent breast reconstruction with TEI in our hospital between May 2016 and August 2017. Patients who had pre-existing conditions that limit shoulder movement were excluded.

Procedures

From May 2016 to Dec 2016 breast cancer patients who underwent reconstructive surgery by a plastic surgeon were referred to a physiatrist for postoperative rehabilitation. A physiatrist evaluated the baseline characteristics of patients at 1 week after surgery. Following conventional protocol, patients were asked to immobilize their shoulder for more than 4 weeks and undergo self-exercise program. At postoperative 1 month and 2 month, the same physiatrist and plastic surgeon evaluated shoulder mobility, pain, QOL and complications. Supervised shoulder physical therapy was performed to treat secondary adhesive capsulitis at 1 month postoperatively. In other cases, self-administered exercise was continued.

From January 2017, the Department of Rehabilitation and Physical medicine and the Department of Plastic Surgery introduced early rehabilitation. Patients were educated to undergo a self-exercise program after short-term immobilization of 2 weeks. Follow-up assessment was carried out similarly as before.

Therefore, it was feasible to compare the two groups of patients within the present study: conventional protocol group including patients enrolled between May 2016 and December 2016; and early rehabilitation group comprising patients enrolled between January 2017 and August 2017 (Figure 1).

Surgical method

Immediately after skin-sparing total mastectomy by a general surgeon, a plastic surgeon inserted tissue expander into the subpectoral plane and placed it under the pectoralis major and serratus muscle fascia.

Self-exercise program

During the immobilization periods, patients were advised not to lift their arms over shoulder height or let their arm fall backwards. All activities that pulled arms toward body were prohibited. After immobilization period ended, patients were instructed to perform a self-exercise program that included progressive shoulder-stretch, beach pose, chest stretch, and biceps curl with light weight. The exercise program included a set of 5 to 10 repetitions, 4 times a day, and 7 days per week.

Measurement

At postoperative 1 week, independent factors that affect the outcomes of rehabilitation protocols were assessed. Personal factors (i.e., age, shoulder range of motion and pain numeric rating scale at postoperative 1 week) and treatment-related factors (i.e., extent of lymph node dissection and history of neoadjuvant chemotherapy) were assessed.

At postoperative 1 month and 2 month, the outcomes of rehabilitation protocols were evaluated. The shoulder range of motion (ROM) and surgical-site complications were evaluated as primary outcomes. Disabilities of arm, shoulder and hand (DASH) score, pain numeric rating scale (NRS), and short-form 36 health survey (SF36) score were measured as secondary outcomes.

Shoulder ROM

Shoulder ROM was measured in flexion, abduction, external rotation and internal rotation in the affected upper limb. Measurements were conducted by a physiatrist using a goniometer with patients in seated position. Patients who showed progressive loss of glenohumeral motion in capsular pattern were diagnosed with secondary adhesive capsulitis.

Surgical site complication

A plastic surgeon reviewed the surgical site for hematoma, seroma, surgical site infection, implant rupture, extrusion of the implant, asymmetry/displacement of the implant and any other complications.

Disabilities of arm, shoulder, and hand outcome measure questionnaire

The DASH questionnaire was used to assess shoulder function. Scores were transformed to a 0 to 100 scale. Inter-

rater and intra-rater reliability of the questionnaire were over 0.95.

Short-form 36 health survey

The SF36 was used to assess QOL. The SF36 contains 8 sections measuring 8 domains of QOL: physical functioning (PF), role limitations because of physical health problems (RP), bodily pain (BP), general health perception (GH), vitality (VT), social functioning (SF), role limitations because of emotional problems (RE), and mental health (MH). The 8 sections are summarized into a two-component summary: the physical component summary (PCS; PF, RP, BP, GH and VT) and mental component summary (MCS; MH, RE, SF, VT and GH). SF 36 is known to exhibit satisfactory internal consistency and good validity among breast cancer survivors. The Korean version was developed and validated.

Statistical analysis

To determine the association between independent factors and outcomes (shoulder mobility, complications, QOL and pain), we used a multiple linear regression model using a stepwise selection procedure. The independent factors were as follows: (1) personal factors including age, shoulder ROM and pain NRS at postoperative week 1; (2) treatment-related factors including extent of lymph node dissection and history of neoadjuvant chemotherapy; and (3) rehabilitation intervention including early rehabilitation or conventional protocol. The criteria for entry and removal were 0.05 and 0.10, respectively.

Independent t-test and chi-square test or Fisher's exact test were used to compare baseline characteristics of two groups. In all tests, p-values less than 0.05 were considered statistically significant. Analysis was carried out using SPSS version 19.

